James W. Stegeman
President
CostQuest Associates, Inc.
6261 Ashbourne Place
Cincinnati, OH 45233

(513) 941-9009
jstegeman@costquest.com

April 17, 2012

VIA ELECTRONIC FILING ***EX PARTE***

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Connect America Fund, WC Docket No. 10-90; High-Cost Universal Service Support, WC Docket No. 05-337*

Dear Ms. Dortch:

CostQuest Associates, Inc. ("CostQuest") submits this ex parte letter to introduce into these dockets material Jim Stegeman presented as a Joint Board for Universal Service, En-Banc witness on February 20th, 2007. His presentation covered the evolution of universal service models by comparing key attributes of the FCC's Synthesis Model (or HCPM) to our then current CostPro efforts. Given that CostPro output, which describes the wireline network topology, is an input to CQBAT (our model that was filed to support CAF Phase 2), we believe the En-Banc material is important to consider in the above listed dockets.

We have attached the slides presented at the hearing, Attachment A, along with the notes that reference the slides and guided Mr. Stegeman's comments, Attachment B.

This material also highlights some of the comparisons (e.g., road routing capabilities) we made in our April 3rd, 2012 Ex-Parte[1] in these dockets in which we compared key attributes of the FCC's Synthesis model to our CQBAT model.

Based on our prior Ex-Parte and this additional material, we believe CQBAT is clearly shown to be an advancement in Universal Service modeling over the FCC's Syntheses model. And, we believe the adoption of CQBAT provides a robust platform to support the implementation of the Connect America Fund.

Please include this letter in the records of the proceedings identified above.

Sincerely yours,

/s/ James W. Stegeman

James W. Stegeman

cc: Katie King
Steve Rosenberg

[1] Letter from James W. Stegeman, CostQuest Associates, Inc., *WC Docket Nos. 10-90, 05-337, (*04/03/2012)

Attachment A

En-Banc Slides

Universal Service and Network Modeling

...then and now

February, 2007

En Banc Presentation

Model Definitions

- Every current universal program relies upon both a “cost model” and a “support model.”
- Definitions:
  - “Cost Model:”: A systematized collection of mathematical procedure that takes as inputs geographic and non-geographic data and that produces an estimate of the cost of providing a telecommunications service
    - Provides a normalized measure so that carriers and geographic areas can be compared on the fair and impartial basis
  - “Support Model:” A mathematical procedure that takes cost data as an input, sets a standard for acceptable customer payment or affordability, applies a funding model (regulatory or carrier based), and finally produces a universal service support amount for the carrier or its customer
    - This is sometimes called a “support mechanism.”

Cost Model Policy Decisions…a short list

- What technologies will the model assume?
  - Will broadband be supported? At what speeds?
  - Is wireless included? Mobility? Cable VoIP?
- What percentage of customers purchase the service?
  - What is the take rate we assume?
  - Do we include COLR costs?
- What is the geographic unit of consideration?
  - Is the ILEC wire center the proper unit?
  - Or should it be Study areas? Census units?
  - Should it account for the Donut/Hole Dr. Staihr recommends?

Advances in Network Modeling

…Network Cost Models “Then” and “Now”

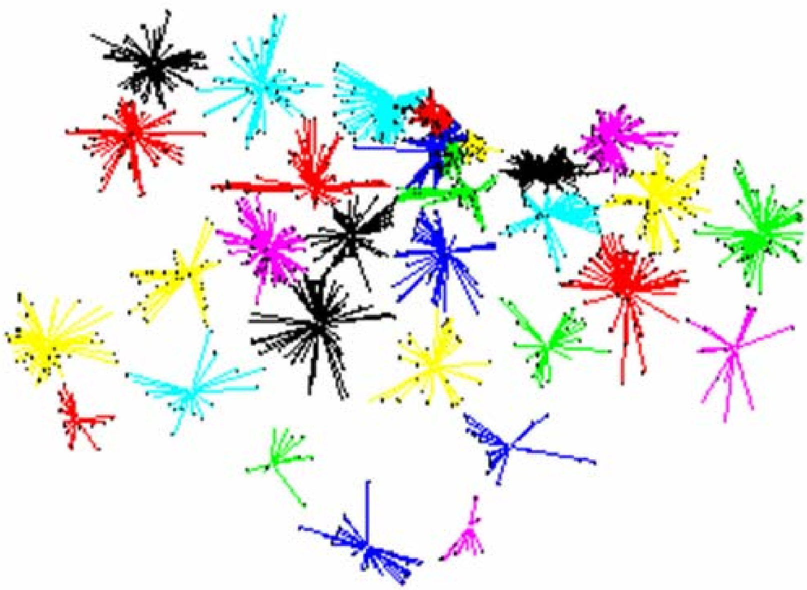
Advancements in Network Modeling

- Improved customer locations
- Improved ability to match engineering designs and constraints
- Improved network routing
- Improved ability to vary the service delivered...broadband designs
- Ability to model multiple terrestrial networks

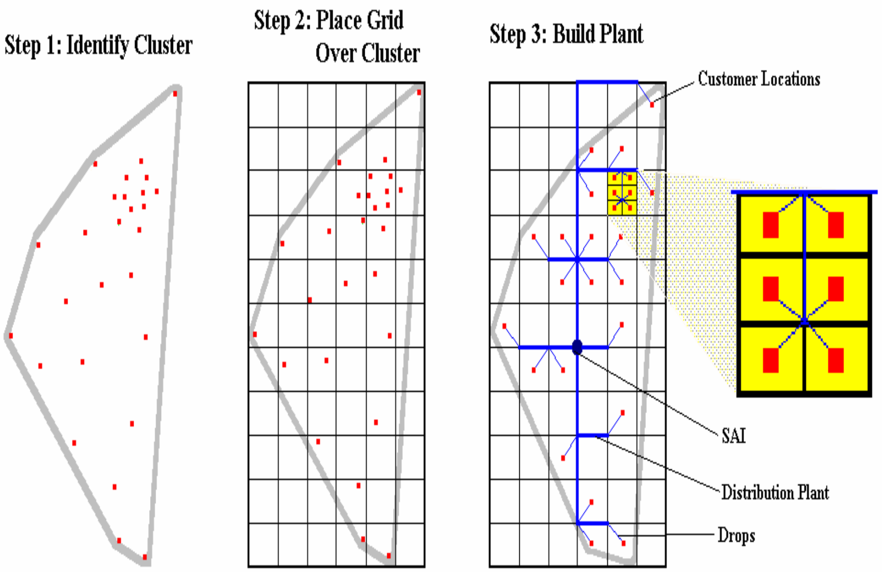
...In general, a more realistic, flexible network design resulting in more accurate cost estimates and improved information for decision makers

THEN…FCC Model Methods for Customers and Engineering Design

Cluster formation



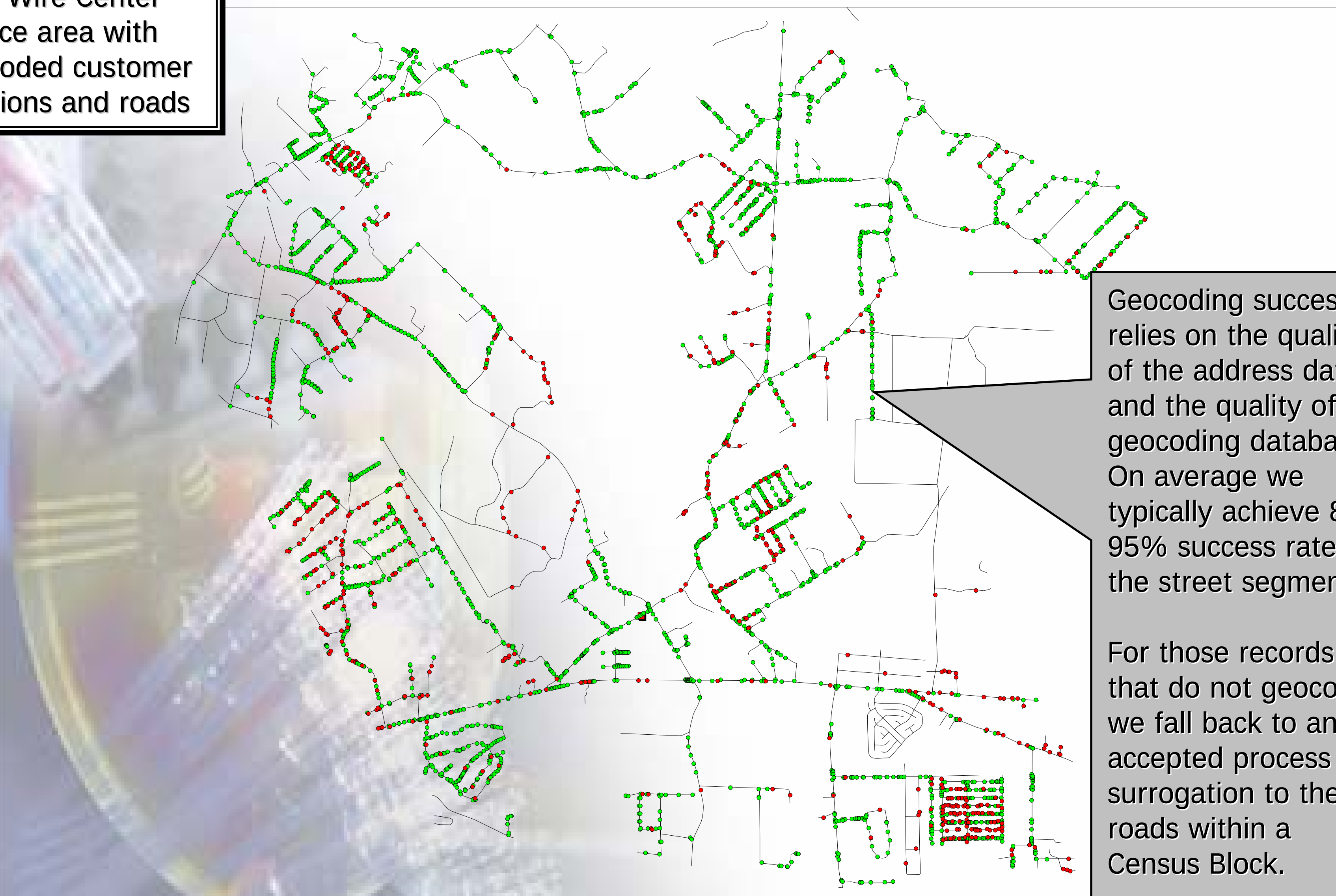
Customer locations and engineering design



Material courtesy of William Sharkey (FCC)

NOW…CostPro Customer and Road Data

ILEC Wire Center service area with geocoded customer locations and roads



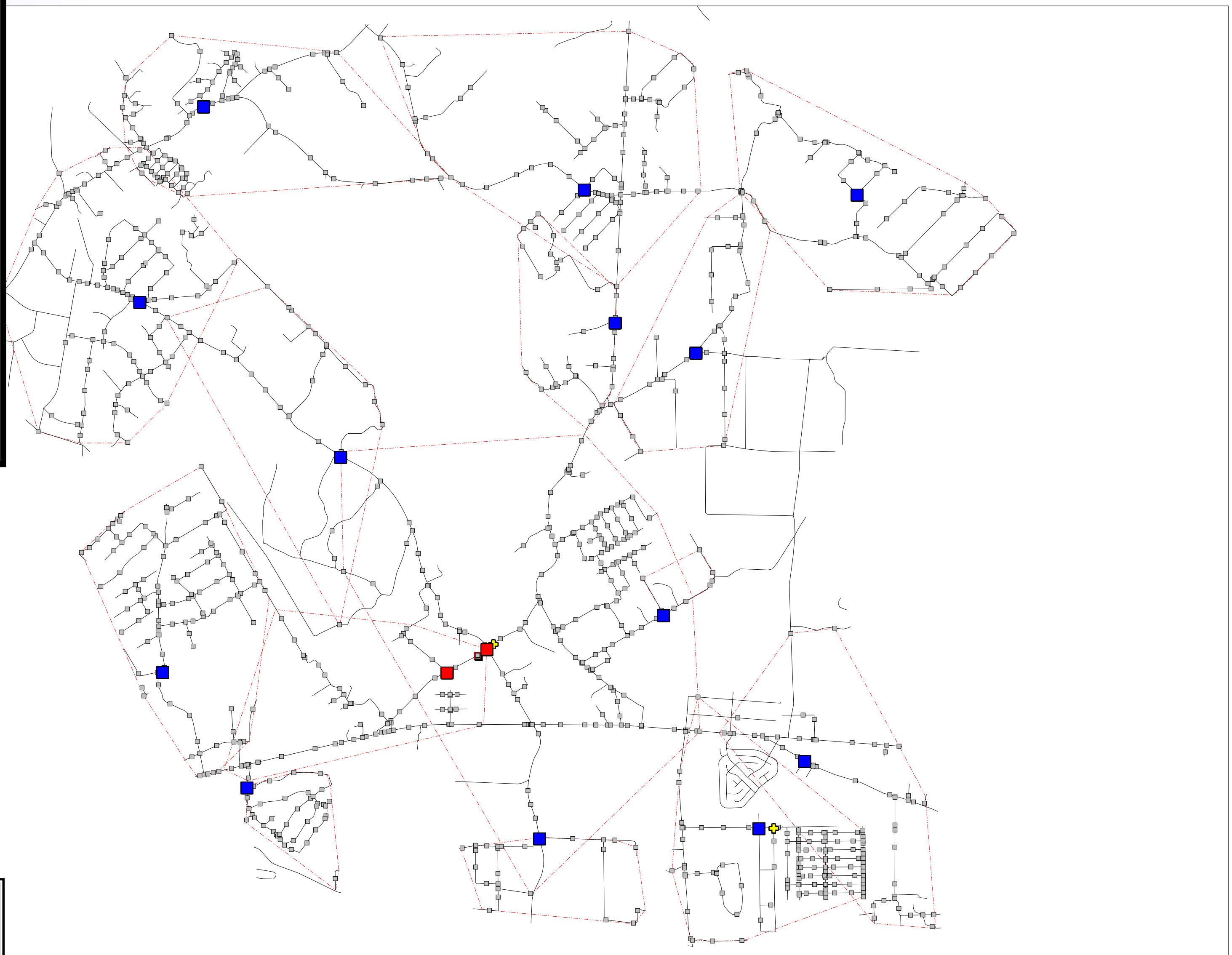
Geocoding success relies on the quality of the address data and the quality of the geocoding databases. On average we typically achieve 80-95% success rates to the street segment.

For those records that do not geocode, we fall back to an accepted process of surrogation to the roads within a Census Block.

NOW…CostPro Engineering Design

Network Node locations are based upon user inputs and general network design principles

Picture captures network nodes with red dashed line representing Road Based Clusters

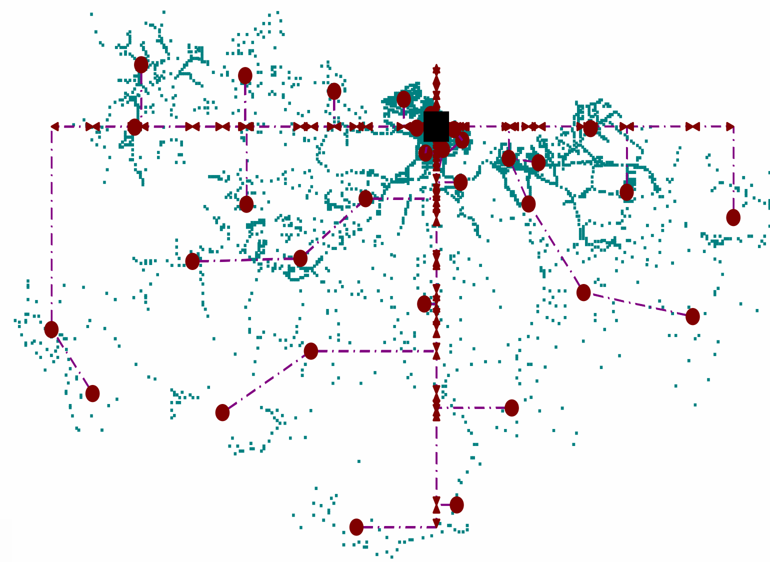


Legend:
- – Digital Loop Carrier
- – Copper fed X-Box
- – Pedestal

THEN…FCC Model Network Routing

Rectilinear Distribution Design

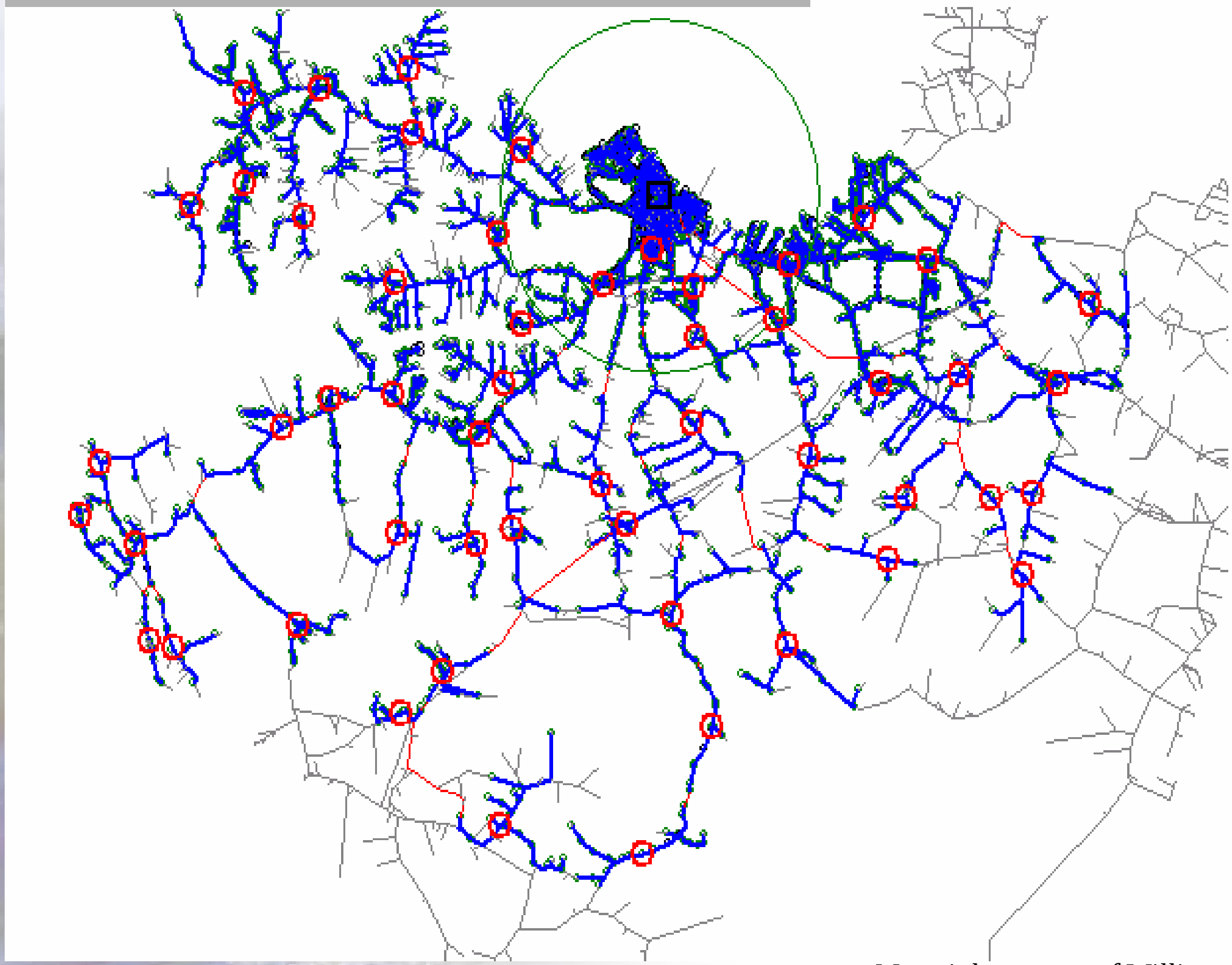
Rectilinear Feeder Design



Material courtesy of William Sharkey (FCC)

NOW…Road Based Networks

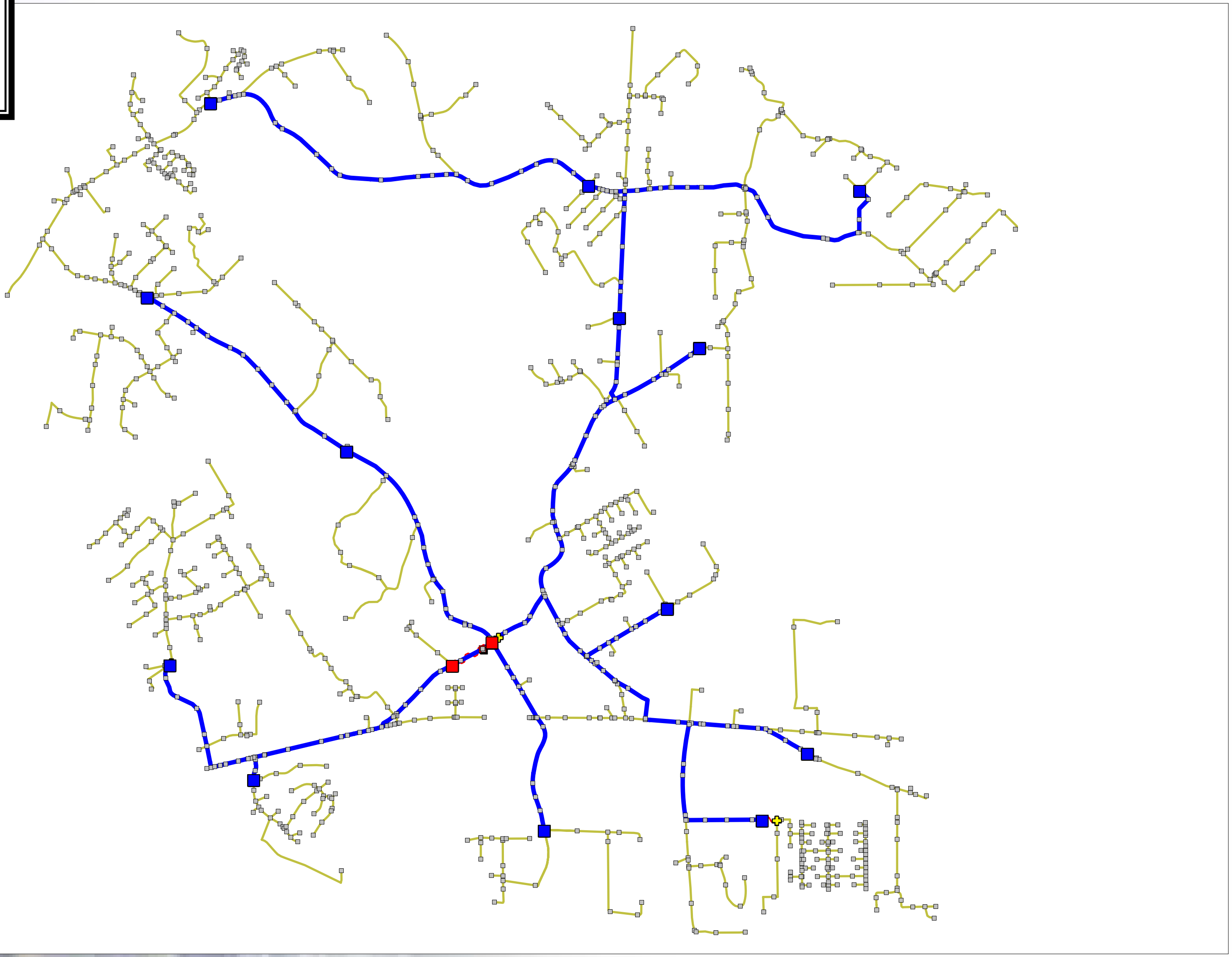
Road based design of wire center on prior chart



Material courtesy of William Sharkey (FCC) and Jeff Prisbrey

NOW…CostPro Road Based Network

Designed Network with overlaid cabling, no roads



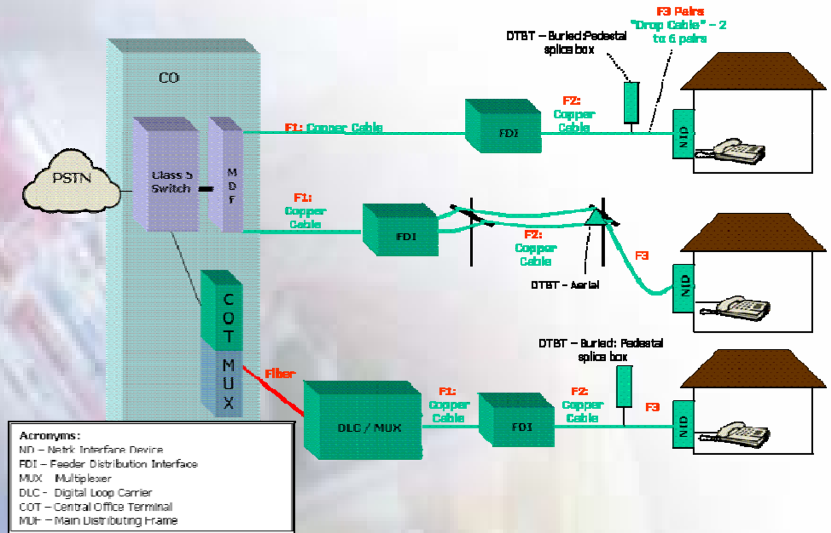
Legend:
- – Digital loop carrier
- – Copper Fed X-Box
- – Pedestal
- – Fiber Feeder
- – Copper Feeder
- – Distribution

THEN…Broadband Network Design

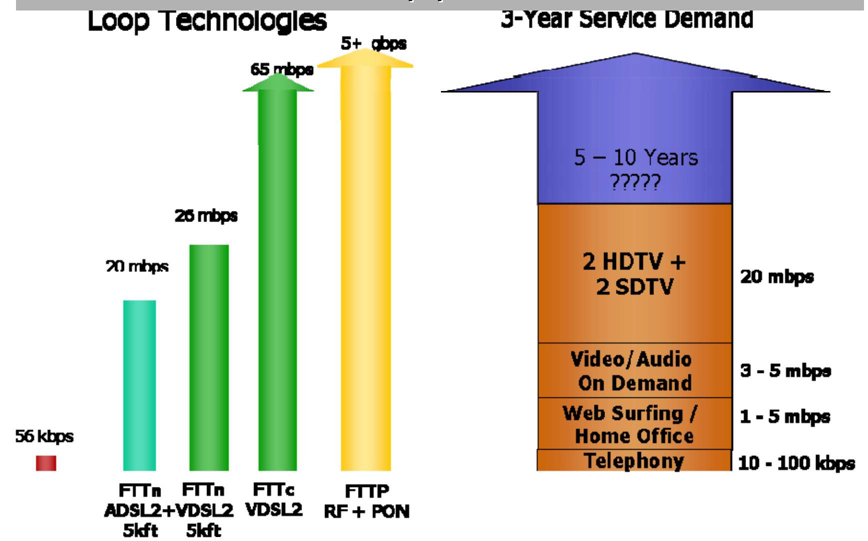
…Advanced services at time of development - 28.8kbs modem service

Wireline Architecture

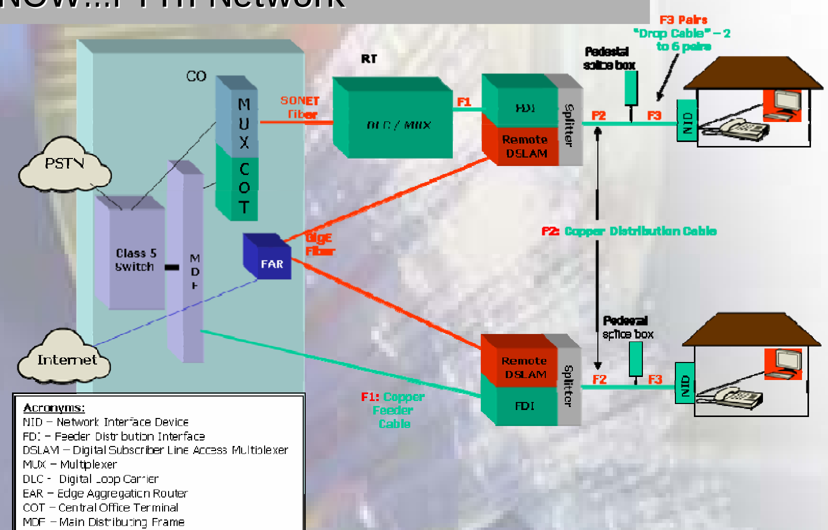
THEN...Voice Network – Current USF model design



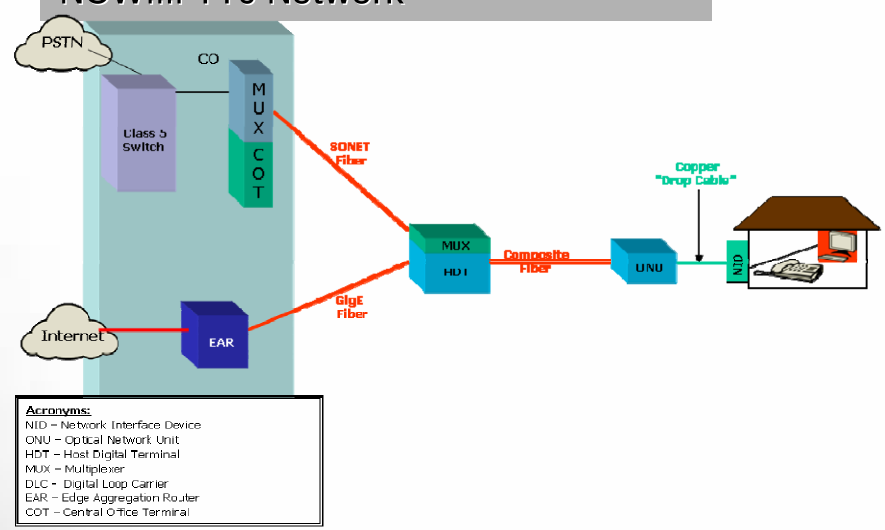
The need for a fatter "pipe" to the customer



NOW...FTTn Network

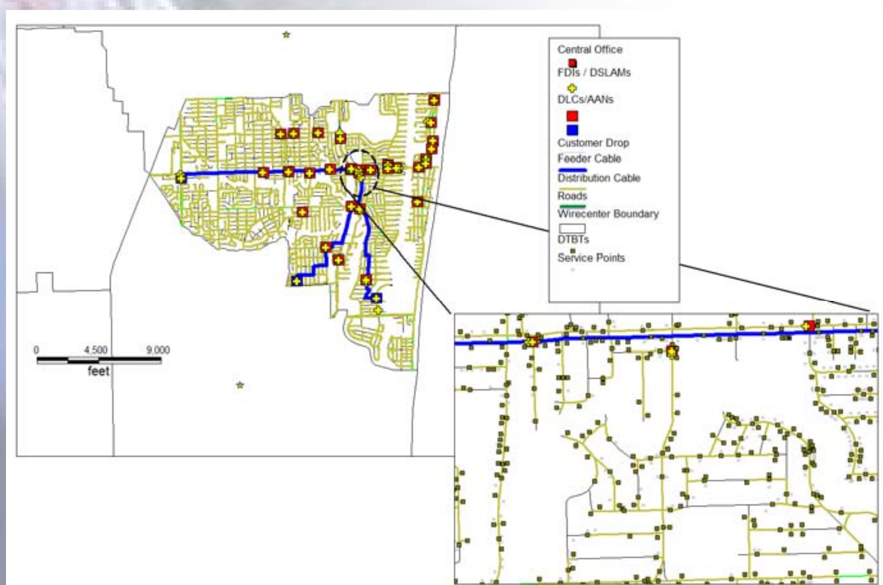


NOW...FTTc Network

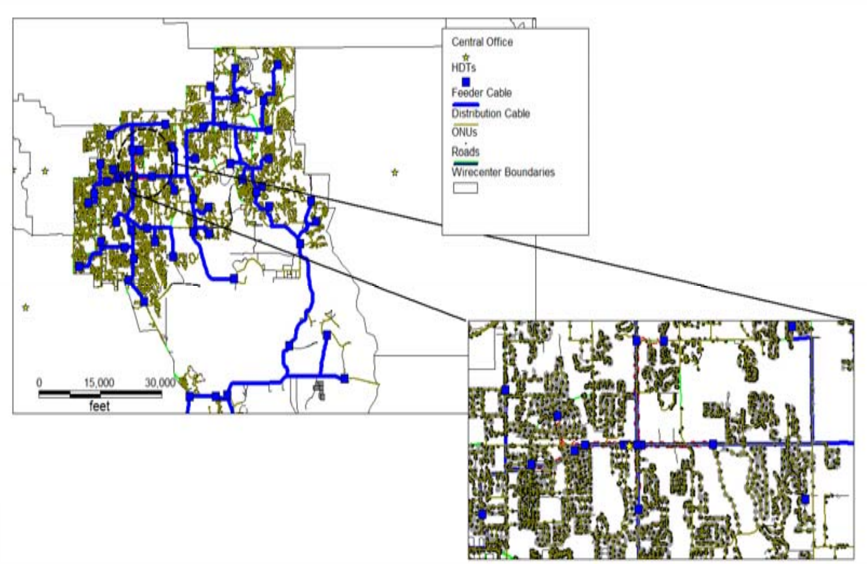


NOW…CostPro Broadband Network Designs

FTTn Network



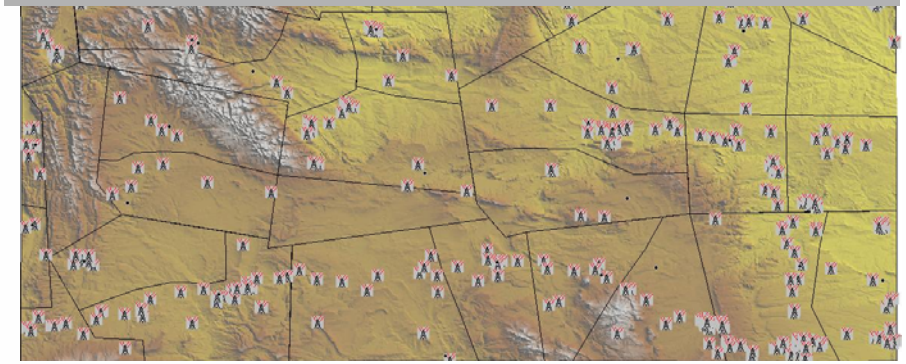
FTTc Network



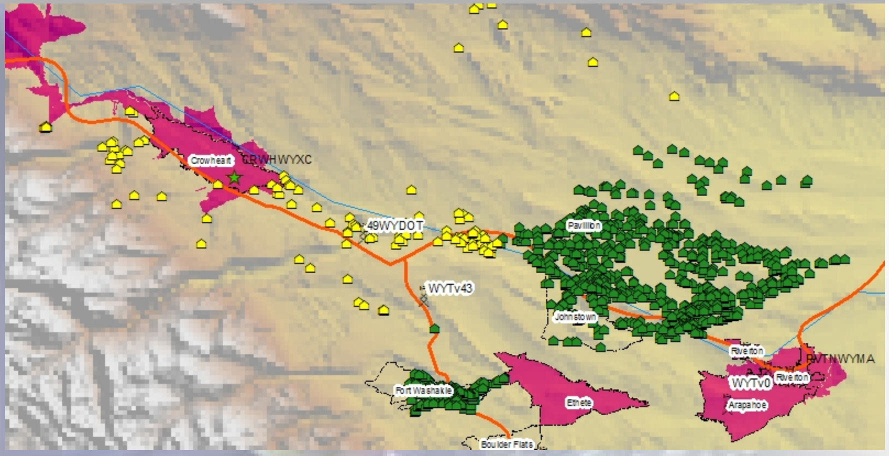
NOW…CostPro Wireless Architecture

- Wireless network design
  - Step 1: Develop tower database
  - Step 2: Select most appropriate towers
  - Step 3: Group towers into serving areas fed by a common interconnection point
  - Step 4: Accumulate customers to towers and size tower equipment
    - Typical design of up to 10 miles for fixed wireless
    - Line of Site limited to 4 miles
  - Step 5: Create backhaul network
    - Typical radio link design of 20 miles (70 mile max)

- Towers are available from a number of national databases
- Wireless serving areas define the backhaul network
  - Each WSA backhauls to a single interconnection point such as a switch or point of interconnection



- Customers are accumulated onto towers so as to efficiently use antenna placements



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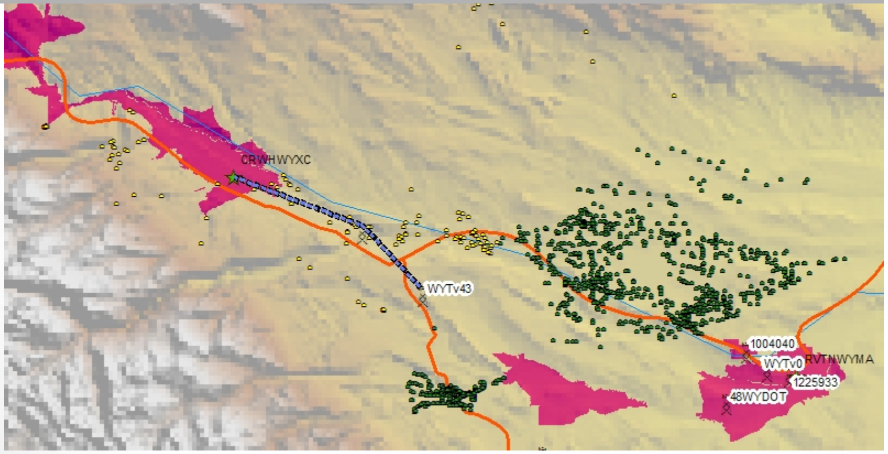
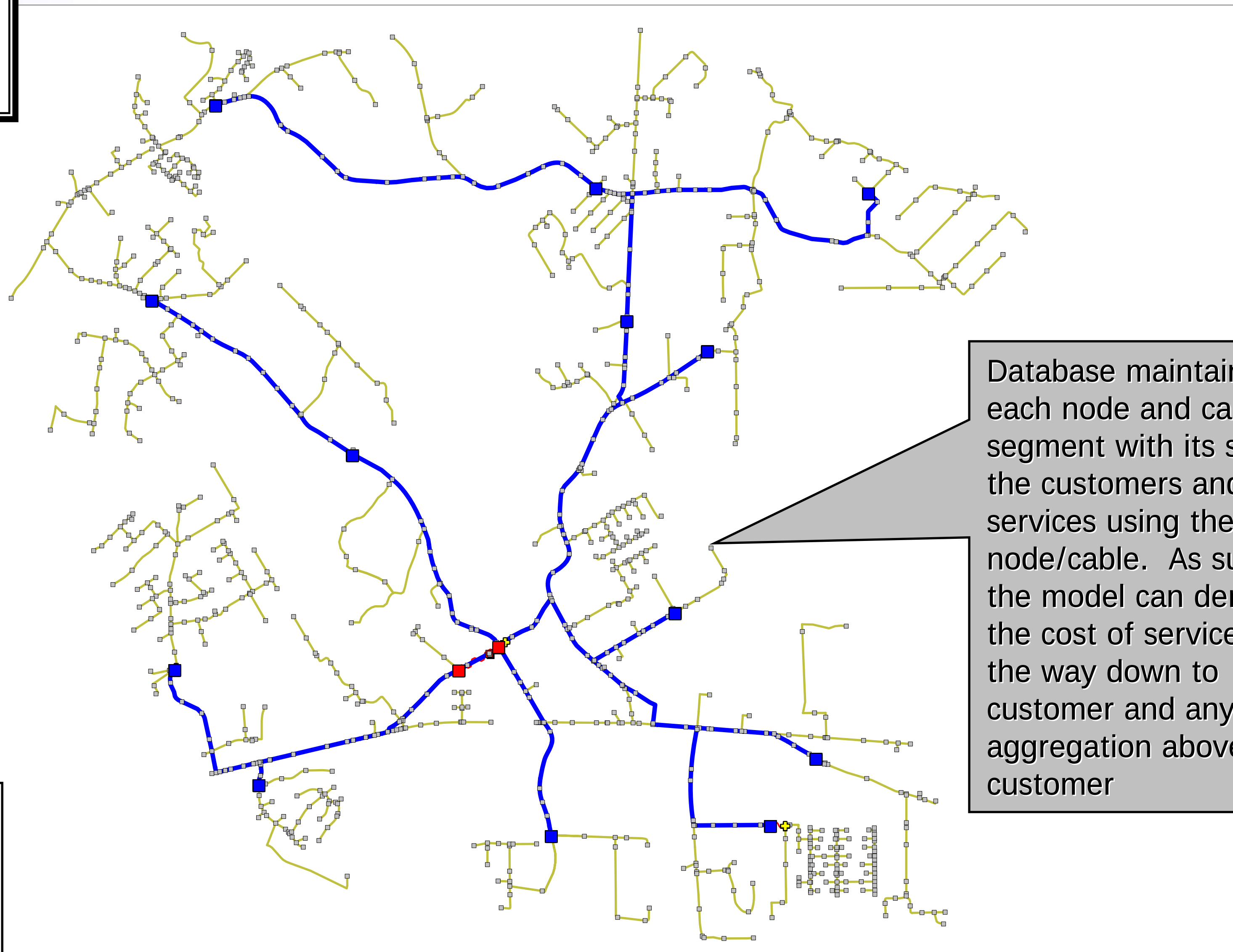


Granularity of Data and Results

CostPro Visualization – Sub Wire Center Detail

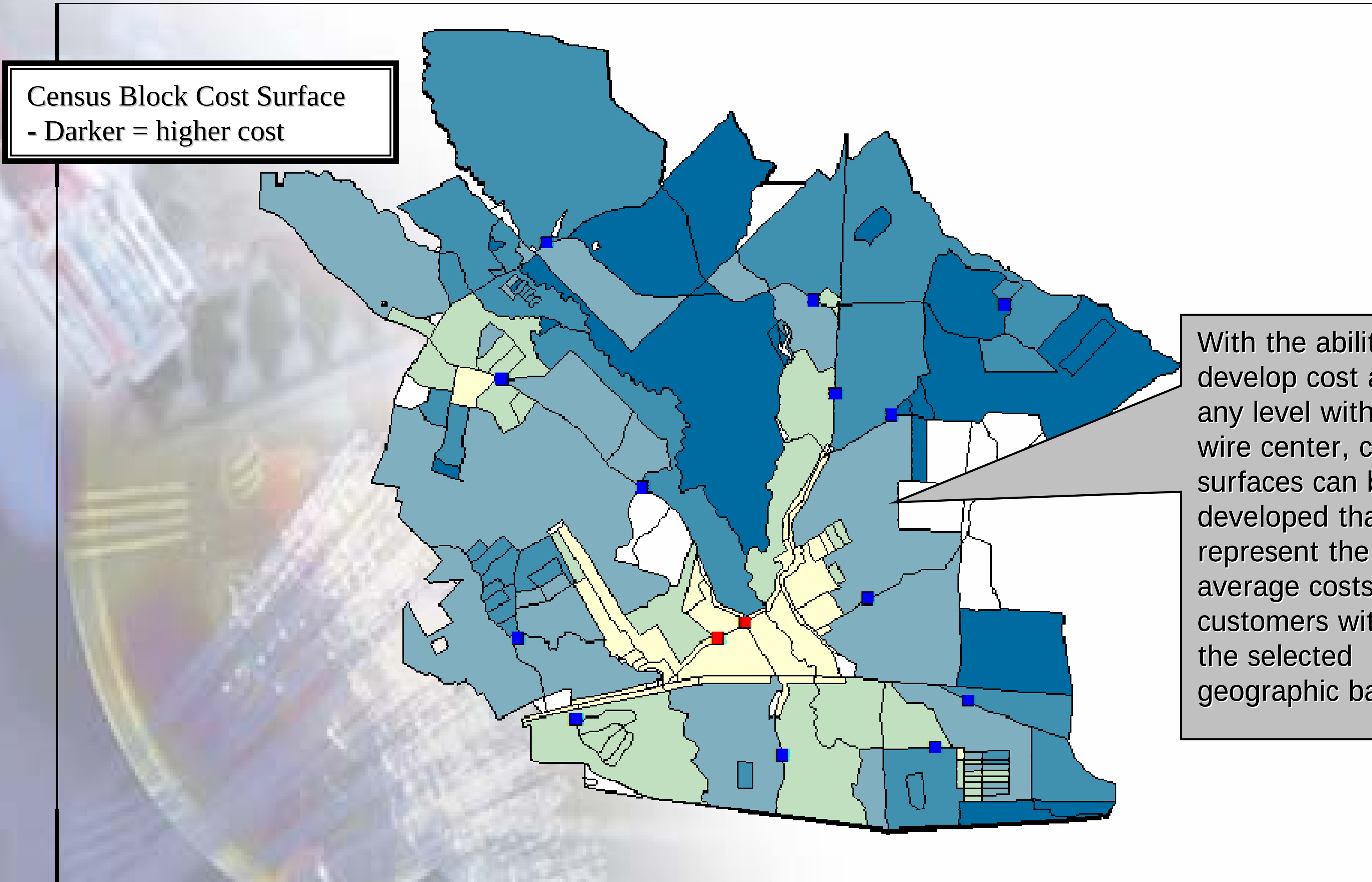
Designed Network with overlaid cabling, no roads



Database maintains each node and cable segment with its size, the customers and services using the node/cable. As such, the model can derive the cost of service all the way down to customer and any aggregation above customer

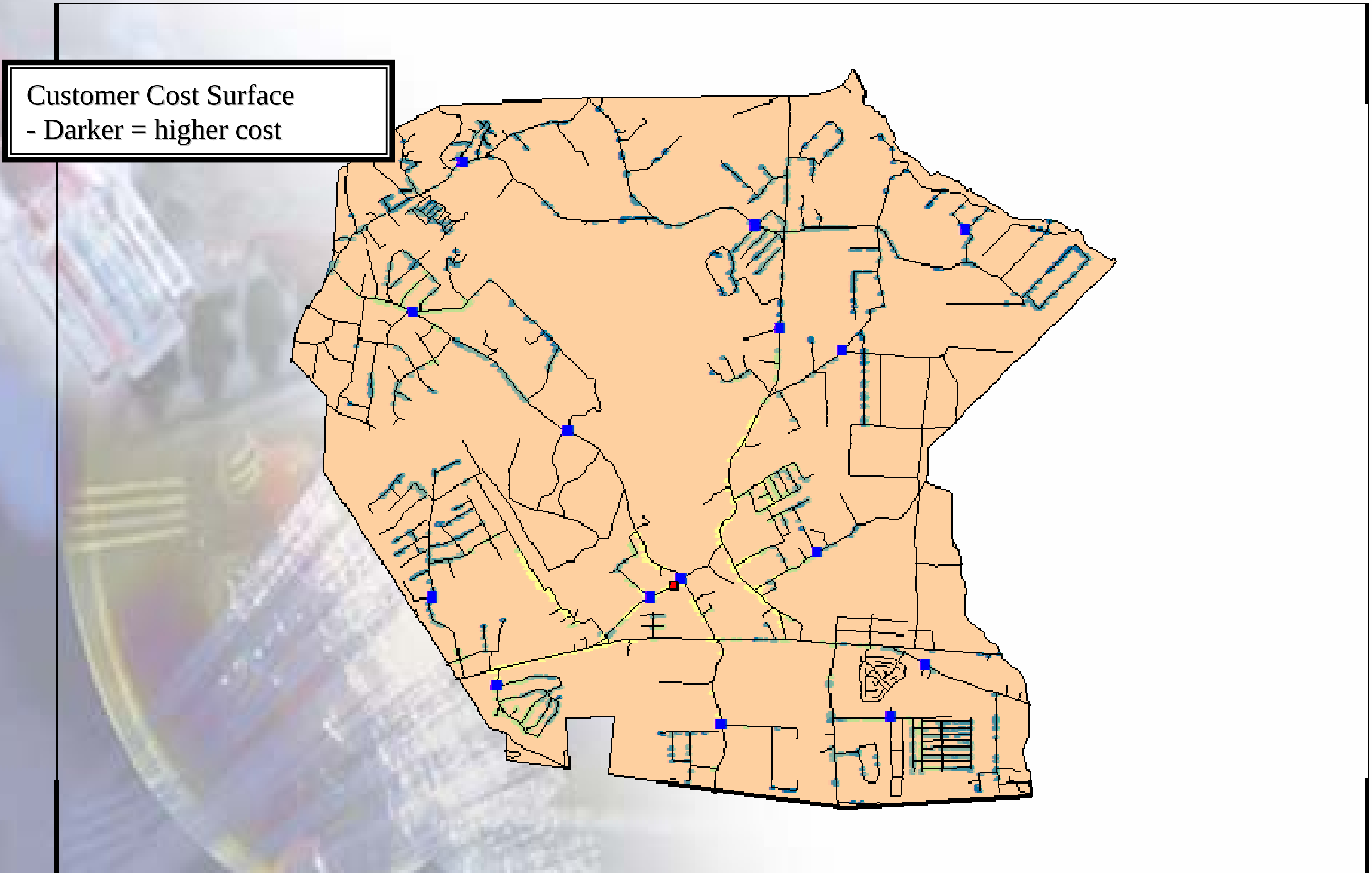
Legend:
- – Digital loop carrier
- – Copper Fed X-Box
- – Pedestal
- – Fiber Feeder
- – Copper Feeder
- – Distribution

CostPro Visualization – Sub Wire Center Detail

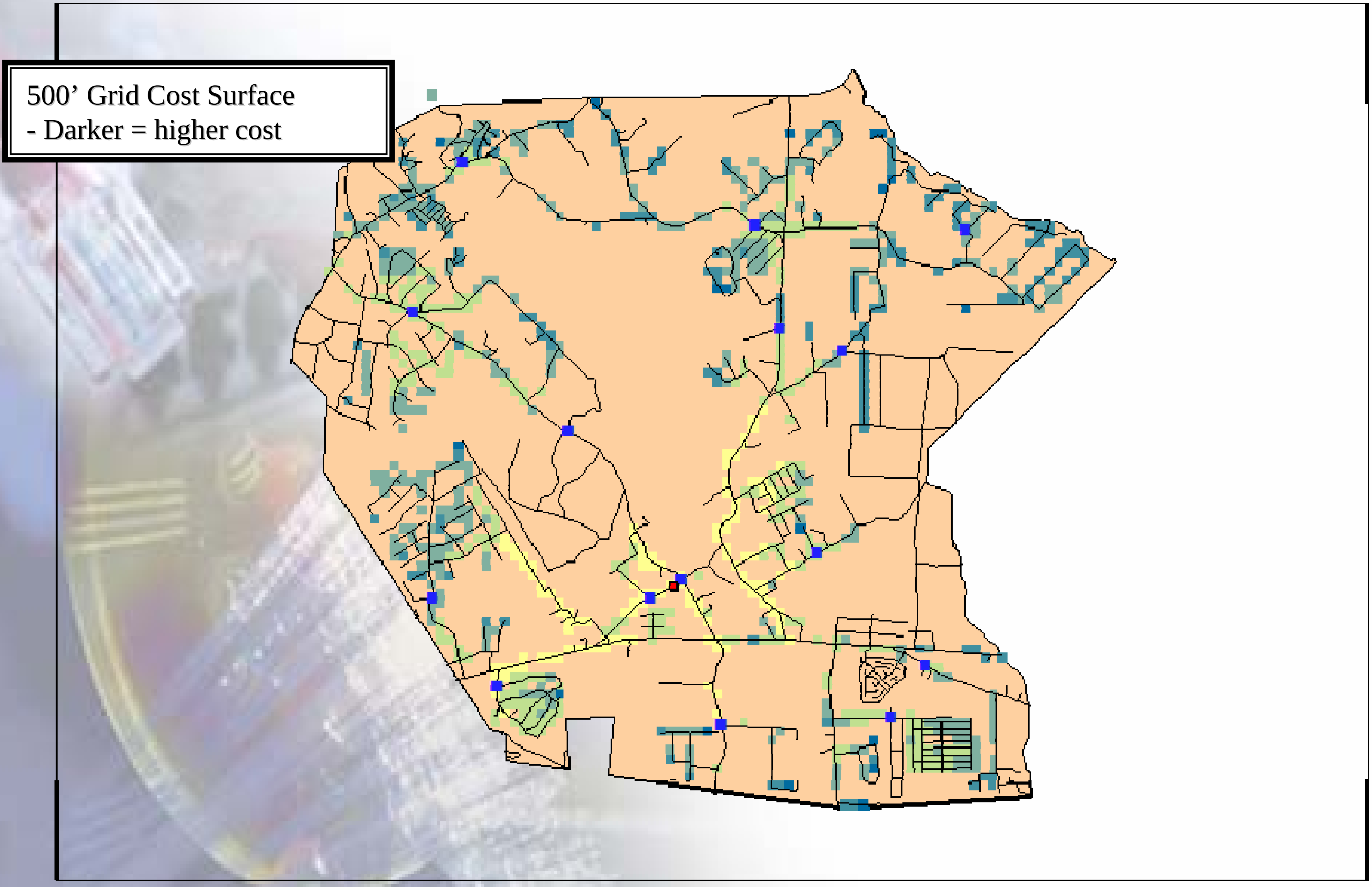


With the ability to develop cost at any level within a wire center, cost surfaces can be developed that represent the average costs of customers within the selected geographic bands

CostPro Visualization – Sub Wire Center Detail



CostPro Visualization – Sub Wire Center Detail



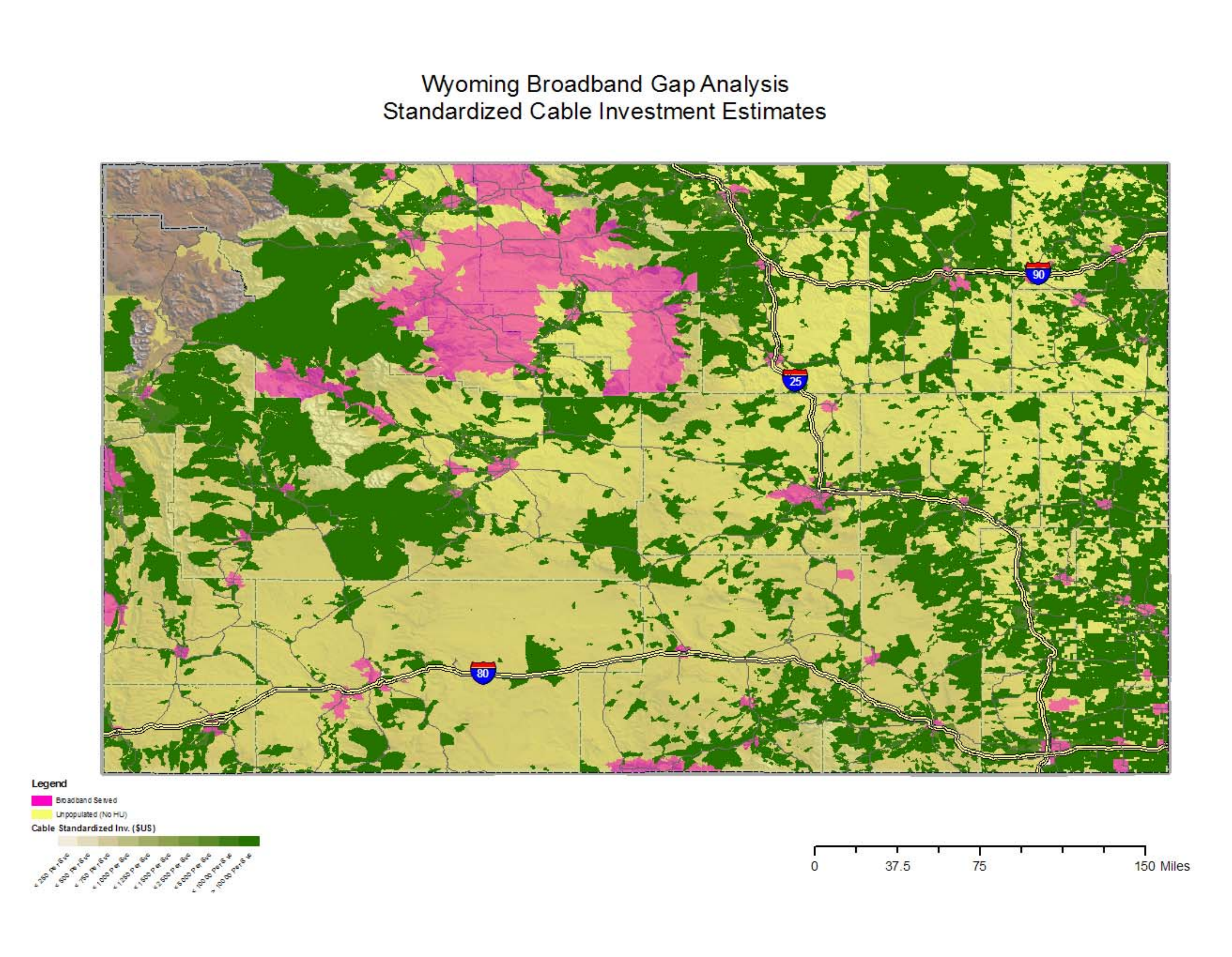
GIS Analysis and Multi-Modal Network Comparison

Wyoming Broadband Study

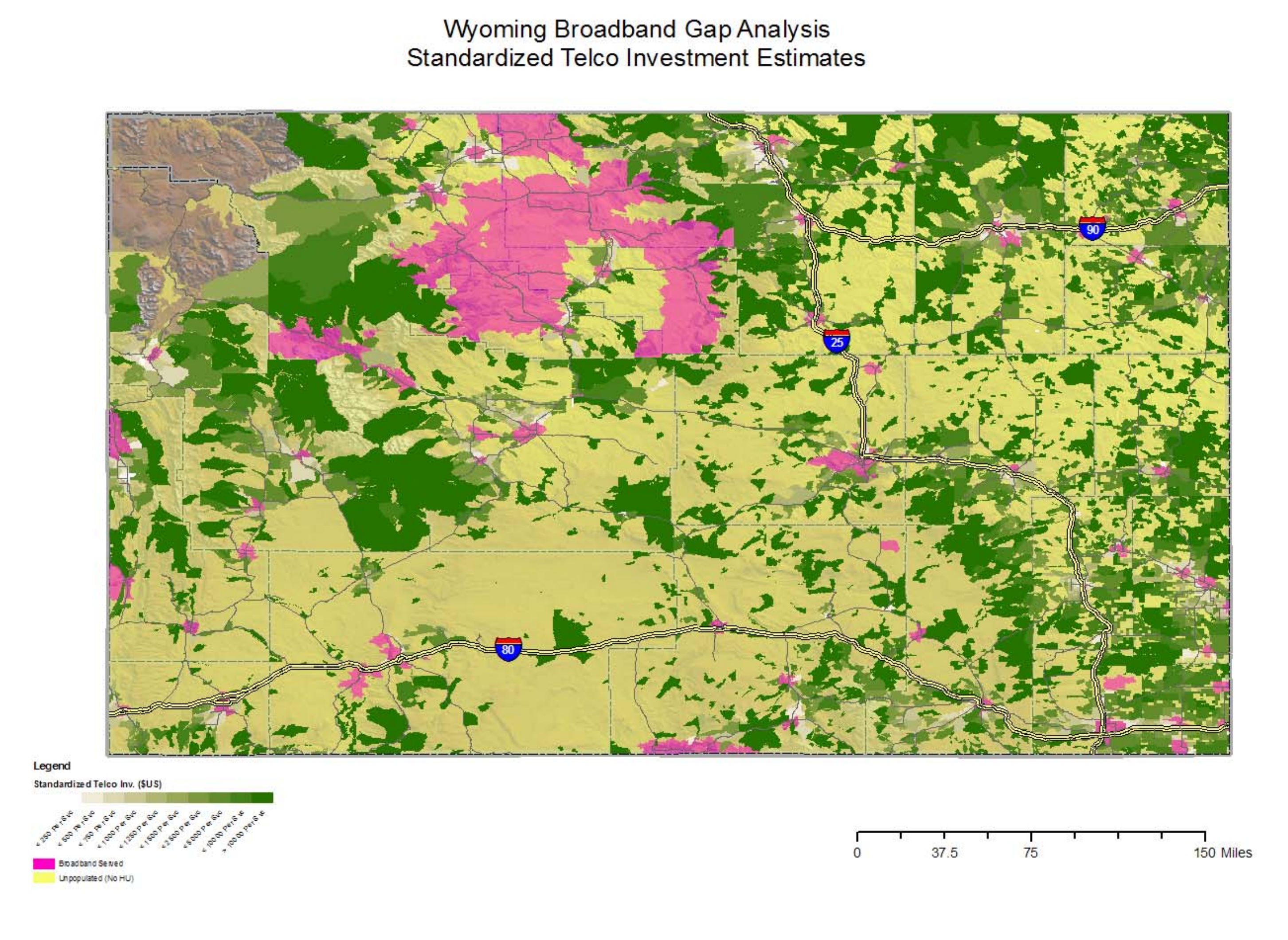
Definition of Study

- Goals of study was
  - Identify Broadband Gap Areas
  - Determine the cost to deploy in a Broadband Gap Areas
    - Technologies being compared
      - Hybrid Fiber/Coax—Cable
      - Fiber/Copper DSLAM—Telco
      - Fixed Wireless—Wireless
      - Satellite
- Broadband capacity was defined as at least 1 Mb/Sec downstream and 256 Kb/Sec upstream

CostProWY
Cable Broadband Augmentation Investment



CostProWY
Telco Broadband Augmentation Investment



Attachment B

En-Banc Notes

Summary Statement of

James Stegeman

Presented at

The Joint Board for Universal Service

En-Banc Proceedings

February 20th, 2007

Good afternoon. First I want to thank the Joint Board Commission and its Staff for inviting me to speak here today. For those that do not know me, my name is James Stegeman. I am president of CostQuest Associates. We are recognized globally as experts in network and economic modeling. We have developed product profitability tools, UNE models, USF models, Impairment Models, and Interconnection models. In regard to USF, we were involved in the creation of the CPM in CA, the CPM Hong Kong, the NUSC in Australia, CostPro in New Zealand, and the BCPM in the US.

On the client side, we work with Large ILECs, rural ILECS, wireless carriers, and state and government agencies.

Today, I am here to discuss the evolution of models, the ability of models to better reflect reality, the ability of models to help one understand the cost differentiation that occurs between wire centers and within wire centers, and the ability to model multiple technologies to provide optimal information for policy makers.

(on slide 2) If we focus on universal service models every current universal program relies upon both a “cost model” and a “support model.”

A “Cost Model” is a systematized collection of mathematical procedures that takes as inputs geographic and non-geographic data and that produces an estimate of the cost of providing a telecommunications service. As such, it provides a normalized measure for comparisons.

A “Support Model” is a mathematical procedure that takes cost data as an input, sets a standard for acceptable customer payment or affordability, applies a funding model (regulatory or carrier based), and finally produces a universal service support amount for the carrier or its customer

With this bifurcation, I believe we can better focus on where issues exist and the decisions that need to be made. Today I will focus on the Cost Model.

As we look at cost models and any potential update of the USF approach, a number of key policy questions need to be addressed.

(Slide 3)
What technologies will the model assume? Will broadband be supported? At what speeds? Is wireless included? Mobility? Cable? VoIP?

What percentage of customers purchase the service? That is, what is the take rate. This will probably be one of the more contentious issues that we did not face when the original USF approach was developed

And, what is the geographic unit of consideration?

I also think it is important for all to understand the capabilities of today's network models as compared to the current modeling approach used in the USF system. Simply put, I would like to show you then and now.

The key about today's models, as shown on slide 5, is that they provide advancements that

…Improve customer locations

…Improve the ability to match engineering designs and constraints

…Improve network routing

…Improve the ability to vary the network design

…And provide the ability to model multiple terrestrial networks

…In general, today's models provide a more realistic, flexible network design resulting in more accurate cost estimates and improved information for decision makers.

On Slide 6, we see the cluster formation and distribution design of the FCC's model. Looking at the image on the left, the clusters or grouping of customers are formed without utilizing road or actual routing and are based upon census data that has been randomly placed within the Census block. On the left side, the engineering cluster that is formed is overlaid with a uniform grid with rectilinear cable routing laid out in a nice, uniform, stylized format. In laying out the network, no road or actual routing is used.

On slide 7, we see the approach used the latest models, including our CostPro model. We first start with customer locations geocoded along the road network. Geocoding simply refers to placing the customer's address at a point on the earth's surface.

With the customer points and the road network, we move to the next step: creating the network.

As you look at this collection of road and customer data, you can almost start to visualize how the network will be deployed…like what we all did in grade school…we connect the dots…we have just added a bit engineering logic and optimization routines to how best to connect the dots along the roads.

On Slide 8, the designed clusters and corresponding Network Node locations based upon CostPro are shown. The clusters and plant locations are optimally selected based upon user inputs, general network design principles, and actual road routing.

Once we have the customers aggregated into clusters, we then need to layout the cabling network and the plant locations.

On Slide 9, we go back to the FCC's model. We see the nice, uniform, stylized distribution design on the left and the feeder design on the right. For distribution, the uniform rectilinear routing looks somewhat like the runways at an airport with a main east west route and a main North South route. For feeder plant on the right, the main feeder routes emanate along the compass rose with subfeeder paths breaking off at right angles. As you look at both pictures, no road or actual routing is used.

On Slide 10, we see the road based designs used in the latest models. For comparative purposes this chart shows the road routing applied to the same dataset I have been showing for the FCC's model. What should jump out is that it does not look anything like the stylized, uniform designs of the FCC's implemented model.

On Slide 11, I show the road based network design used in CostPro. The blue on the chart shows fiber feeder, the red shows copper feeder, and the yellow captures the copper distribution. Looking at this, it is clear that the approach captures how a realistic network is laid out and designed.

On slide 12, I show the broadband capable network within the current FCC model. From the blank screen, you might be thinking Jim forgot a chart. Not really, the blank screen reflects the fact that the current FCC model develops a network capable of voice service, not broadband.

On Slide 13, I show the network schematics of the historical voice network, and the latest generation fiber based networks. Included in the charts is a demonstration of the bandwidth requirements and how the various network designs can meet these demands. I do not have the time to go over the chart in detail, but suffice it to say, the network deployments of today are different than what is designed in the FCC's model.

On slide 14, The FTTn and FTTc road based designs available in CostPro are shown. The key logic driver for these networks, beyond road routing, is termination point of fiber in the network.

Another development that has occurred since the historical models were released is the explosion of wireless, both mobile and fixed. On slide 15, I walk through the general steps we have used to capture wireless costs with the CostPro platform. In general, the modeling is both easier and more difficult. Granted, we do not have to capture road routing. However, we now have to capture RF propagation or viewsheds to capture what customers and roads can be served by a tower.

Now let me move to a key concept -- the ability to look at cost differentiation between and within wire centers.

On Slide 17, I am showing the network design of the CostPro model that I showed earlier. In addition to the visual detail, the model maintains each node and cable segment along with the customers and services using the node and/or cable segment. As such, the model can derive the cost of service all the way down to customer and any aggregation above.

In Slide 18, we have simply averaged the cost over Census Blocks. As you can see the costs are lower, shown as a lighter color, closer to the central office and rise, shown as a darker color, as we move out to the more sparsely populated areas, a somewhat crude donut and hole.

In Slide 19, we show the cost variations at the customer level. Each dot represents a customer with the darker color indicating higher cost.

In Slide 20, we show the cost variations using 500 foot grid cells. The key take away is that with the granularity of the model, any geographic grouping is possible.

As a final topic, let me quickly walk through our recent Wyoming Broadband study. This project highlights the ability to use GIS to help showcase and understand the issues, the ability to model multiple technologies, and the value of these models to provide valuable information to policy makers.

On slide 22, the goals of the Wyoming study were to
…Identify Broadband Gap Areas
…and, determine the cost to deploy in a Broadband Gap Areas via multiple Technologies

To demonstrate the study and our findings, we display the findings in a GIS visualization. On page 23, pink is broadband enabled portions of the state, yellow is unpopulated, and the gradations of green represent the cost of deploying cable on a per customer basis. As you look at this, make a few notes. First, 80% of Wyoming households have access to broadband and are located in the pink areas. Second, a good proportion of the state is unpopulated. And third, while most of the cable areas are dark green or high cost, this does not imply that Cable is a high cost service. Rather, due to the fact that the existing cable networks are all ready broadband enabled and only cover a small footprint, the cost to expand the broadband customer base is really a Greenfield deployment. That is, they do not have existing facilities in these gap areas to augment.

Now let's look at Telco. On Slide 24, we see the same layout. However, the green shading represents the telco costs. As you should note, there are quite a few areas with lighter shades of green or lower cost, as compared to cable.

Finally, if we look at fixed wireless on slide 25, we see the same layout, with the addition of orange shading which reflects areas that could not be covered with the existing towers in Wyoming. While it visually appears that fixed wireless is more efficient than Telco or Cable, the cost to augment telco is actually more cost effective for a majority of the customers who fall into the broadband gap areas. What we can gather from the uniform light green is that Fixed Wireless is more efficient based on land area and that it offers economies in the less dense portions of the state.

I wish we had more time to walk through these models, the Wyoming results, and even modeling with reverse auctions but the clock is telling me I have already passed my time limit. But, as I close my session, I know parties in this room may have had issues with the models of the past. Visually, they had issues, and they were limited on the technology side, just to name a few. But on the flip side, I hope I have been able to convey that today's models offer significant advancements in methods, data, technologies, accuracy, and application. In fact, these models are being used today for more than just USF. They are used to set UNE and interconnection rates and retail prices, to provide information on technology deployment, for property tax and merger valuations, and in profitability analysis. Quite frankly, they are an integral part of the telecom landscape.

Thank you for your time.